ABSTRAK

Optimasi Jumlah NaOH dan Waktu Sintesis 3,4,4'- Trimetoksikalkon dari 4'-Metoksiasetofenon dan 3,4-Dimetoksibenzaldehid

Cindi Saputri, Rehana, Muhamad Salman Fareza

Latar Belakang : Senyawa 3,4,4'-trimetoksikalkon dapat disintesis melalui reaksi kondensasi Claisen-Schmidt. Pemilihan jumlah NaOH dan lama waktu sintesis yang tepat sangat penting karena akan mempengaruhi jumlah rendemen yang dihasilkan. Optimasi dengan *Software Design Expert Version 11* dipilih untuk mendapatkan jumlah NaOH optimum dan waktu sintesis optimum. Penelitian ini bertujuan untuk mendapatkan kondisi optimum meliputi jumlah NaOH optimum dan waktu optimum dalam sintesis 3,4,4'-trimetoksikalkon.

Metodologi : Penelitian ini meliputi pembuatan rancangan percobaan dengan menggunakan *Respon Surface Methodology* (RSM) dengan matriks *Central Composite Design* (CCD) pada *Software Design Expert Version 11*, Sintesis 3,4,4'-trimetoksikalkon berdasarkan rancangan percobaan, dan optimasi hasil sintesis yang didapat dengan *software Design Expert Version 11*. Identifikasi senyawa hasil sintesis dilakukan menggunakan KLT, uji titik leleh, dan spektrofotometri UV.

Hasil Penelitian : Pada penelitian ini jumlah NaOH dan waktu sintesis optimum yang didapatakan yaitu pada jumlah NaOH 8,96 mmol dan waktu sintesis 191 menit. Nilai optimum tersebut diprediksi akan menghasilkan respon % rendemen sebesar 95,86%. Setelah dilakukan validasi pada nilai optimum dengan tiga kali replikasi didapatkan % rendemen yang sebenarnya yaitu 97,2%, 96,6%, dan 96,48%.

Kesimpulan : Menurut statisika hasil tersebut sama dengan prediksi rendemen *Software Design Expert Version 11* karena selisih prediksi dengan validasi kurang dari 5%.

Kata Kunci : Sintesis 3,4,4'-trimetoksikalkon, jumlah NaOH dan waktu sintesis optimum, optimasi RSM.

ABSTRACT

Optimization of NaOH Amount and Synthesis Time 3,4,4 '- Trimethoxychalcone from 4' -Methoxyacetophenone and 3,4-Dimethoxybenzaldehyde

Cindi Saputri, Rehana, Muhamad Salman Fareza

Background : 3,4,4'-trimethoxychalcone can be synthesized through the Claisen-Schmidt condensation reaction. Choosing the right amount of NaOH and the length of synthesis time is very important because it will affect the amount of yield produced. Optimization with Software Design Expert Version 11 was chosen to get the optimum amount of NaOH and optimum synthesis time. This study aims to obtain the optimum conditions including an optimum amount of NaOH and optimum synthesis time in synthesis 3,4,4'-trimethoxychalcone.

Methods : This research included making the experimental design using Response Surface Methodology (RSM) with the Central Composite Design (CCD) matrix in Software Design Expert Version 11, Synthesis 3,4,4'- trimethoxychalcone based on experimental design, and optimization of the synthesis results obtained with Design Expert Version 11 software. Identification of the synthesized compound was carried out using TLC, melting point test, and UV spectrophotometry.

Results : In this study, the optimum amount of NaOH and synthesis time obtained was the amount of NaOH 8.96 mmol and synthesis time of 191 minutes. The optimum value is predicted to produce a response yield of 95.86%. After validating the optimum value with three replications, the actual yield is 97.2%, 96.6%, and 96.48%.

Conclusion : According to the statistics the results are the same as the predicted yield of Software Design Expert Version 11 because the difference between predictions with validation is less than 5%.

Keywords : 3,4,4’-trimethoxychalcone synthesis, the optimum amount of NaOH and optimum synthesis time, optimization of RSM.